

SEQUENCE LISTING

<110> Falco, Carl
Famodu, Layo O.
Orozco, Buddy
Rafalski, Antoni
Thorpe, Cathy

<120> Tetrahydrofolate Metabolism Enzymes

<130> BB1179 USDIV1

<140>

<141>

<150> US 60/092,869

<151> 1998-07-15

<150> US 09/351,703

<151> 1999-07-12

<150> US 09/903,814

<151> 2001-07-12

<160> 22

<170> Microsoft Office 97

<210> 1

<211> 560

<212> DNA

<213> Zea mays

<220>

<221> unsure

<222> (442)

<223> n is a, c, g or t

<220>

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<222> (520)

<223> n is a, c, g or t

<400> 1

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gcggcggtg	agcaacgtgc	cggagtccac	cgtctacggg	ggccccacgcc	cgcaggagtc	180
ctcggcggtg	cgggcggtga	cggtgaccac	actccgtggg	aagcaccgcc	gcggggagcc	240
catcaccgtc	gtcaccgcct	acgactaccc	ctcggcggtc	cacgtcgact	ccgccggcat	300
cgacgtctgc	ctcgtcggtg	actccgccgc	catggtcgtc	cacggccacg	acaccacgct	360
ccccatcacg	ctcgacatca	tgtctgaagc	actgccgcgc	cgttggtccc	gggcgcgcgc	420
cgcccgctcc	tcgtcggtga	tntccaattc	ggctgctaca	atccttcggc	gccaagctgt	480
tgattaaccg	ttaaaggtctc	aaggaagtgg	atggtgcatn	aactggaagg	ggtgccatca	540
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<210> 2

<211> 375

<212> PRT

<213> Zea mays

<400> 2

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Val	Arg	Ala	Thr	Arg	Asp	Thr	Met	Arg	Arg	Ser	Leu	Pro	Leu	Leu	Leu	
			20					25					30			
Ala	Arg	Gln	Val	Ala	Arg	Gln	Arg	Arg	Leu	Ser	Asn	Val	Pro	Glu	Ser	
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Thr	Val	Tyr	Gly	Gly	Pro	Arg	Pro	Gln	Glu	Ser	Ser	Ala	Ala	Arg	Arg	
	50					55					60					
Val	Thr	Val	Thr	Thr	Leu	Arg	Gly	Lys	His	Arg	Arg	Gly	Glu	Pro	Ile	
65					70					75					80	
Thr	Val	Val	Thr	Ala	Tyr	Asp	Tyr	Pro	Ser	Ala	Val	His	Val	Asp	Ser	
				85					90					95		
Ala	Gly	Ile	Asp	Val	Cys	Leu	Val	Gly	Asp	Ser	Ala	Ala	Met	Val	Val	
			100					105					110			
His	Gly	His	Asp	Thr	Thr	Leu	Pro	Ile	Thr	Leu	Asp	Ile	Met	Leu	Glu	
		115					120					125				
His	Cys	Arg	Ala	Val	Ala	Arg	Gly	Ala	Pro	Arg	Pro	Leu	Leu	Val	Gly	
	130					135					140					
Asp	Leu	Pro	Phe	Gly	Cys	Tyr	Glu	Ser	Ser	Ala	Ala	Gln	Ala	Val	Asp	
145					150					155					160	
Ser	Ala	Val	Arg	Val	Leu	Lys	Glu	Gly	Gly	Met	Asp	Ala	Ile	Lys	Leu	
				165					170					175		
Glu	Gly	Gly	Ala	Pro	Ser	Arg	Ile	Thr	Ala	Ala	Lys	Ala	Ile	Val	Glu	
			180					185					190			
Ala	Gly	Ile	Ala	Val	Met	Gly	His	Val	Gly	Leu	Thr	Pro	Gln	Ala	Ile	
		195					200					205				
Ser	Val	Leu	Gly	Gly	Phe	Arg	Pro	Gln	Gly	Lys	Thr	Val	Asp	Ser	Ala	
	210					215					220					
Ile	Lys	Val	Val	Glu	Thr	Ala	Leu	Ala	Leu	Gln	Glu	Ala	Gly	Cys	Phe	
225					230					235					240	
Ser	Val	Val	Leu	Glu	Cys	Val	Pro	Ala	Pro	Val	Ala	Ala	Ala	Ala	Thr	
			245						250					255		
Ser	Ala	Leu	Lys	Ile	Pro	Thr	Ile	Gly	Ile	Gly	Ala	Gly	Pro	Phe	Cys	
		260						265					270			
Ser	Gly	Gln	Val	Leu	Val	Tyr	His	Asp	Leu	Leu	Gly	Met	Leu	Gln	His	
		275					280					285				
Pro	His	His	Ala	Lys	Val	Thr	Pro	Lys	Phe	Cys	Lys	Gln	Phe	Gly	Asn	
	290					295					300					
Val	Gly	Asp	Val	Ile	Asn	Lys	Ala	Leu	Ser	Glu	Tyr	Lys	Gln	Glu	Val	
305					310					315					320	

Ser Arg Gln Ala Phe Ser Ala Gly Val Lys Leu Ile Gly Ala Thr Ser
100 105 110

His Phe Val Thr Pro Glu Leu Asp Ala Gly Pro Ile Ile Glu Gln Met
115 120 125

Val Glu Arg Val Ser His Arg Asp Thr Leu Gln Ser Phe Val Val Lys
130 135 140

Ser Glu Asn Leu Glu Lys Gln Cys Leu Thr Glu Ala Ile Lys Ser Tyr
145 150 155 160

Cys Glu Leu Arg Val Tyr His Met Asn
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<210> 5
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<212> DNA
<213> Oryza sativa

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<220>
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<222> (510)
<223> n is a, c, g or t

<220>
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<222> (545)
<223> n is a, c, g or t

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cgccaacgac gaccacatcc tgacgctgtc atgcccgac aagccgggca tcgtccacgc 180
cgtgactggc atctttgcct cgcgggtcgg caacattctt gacctgaagc agttctccga 240
cacgggggtcg caaaagttct tcatgcgggg gcactttggc ccagtggccg agacggcgga 300
cctctctgcc gacttctcgg ctctggcgtc gcagtacgac cccatgacct gggacatccg 360
gccggtggcg caaaagacgc gcgtcctgat atggtgtcaa gatcggcact gtctcaacga 420
cctgctgttc cgcgcccgag gcggccgcct cgccgtcact ggccatcatg tgtaaacacc 480
cgacttgccg cctggcgag cagcngtcan tcgcactgcc gtcacaagaa caagaccaca 540
ggagnagaat ccaactgcaa gac 563

<210> 6
<211> 278
<212> PRT
<213> Oryza sativa

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1 5 10 15

Val Thr Gly Ile Phe Ala Ser Arg Ser Val Asn Ile Leu Asp Leu Lys
20 25 30

Gln Phe Ser Asp Thr Gly Ser Gln Lys Phe Phe Met Arg Val His Phe
 35 40 45
 Gly Pro Val Ala Glu Thr Ala Asp Leu Ser Ala Asp Phe Ser Ala Leu
 50 55 60
 Ala Ser Gln Tyr Asp Pro Met Thr Trp Asp Ile Arg Pro Val Ala Gln
 65 70 75 80
 Lys Thr Arg Val Leu Ile Met Val Ser Lys Ile Gly His Cys Leu Asn
 85 90 95
 Asp Leu Leu Phe Arg Ala Gln Ser Gly Arg Leu Ala Val Asp Val Ala
 100 105 110
 Leu Ile Val Ser Asn His Pro Asp Phe Ala Pro Leu Ala Ala Ser His
 115 120 125
 Gly Val Glu Phe Arg His Leu Pro Val Thr Lys Glu Thr Lys Thr Gln
 130 135 140
 Gln Glu Glu Glu Ile Leu Lys Leu Ala Lys Glu Arg Asp Val Glu Leu
 145 150 155 160
 Ile Val Leu Ala Arg Tyr Met Gln Val Leu Ser Pro Thr Leu Cys Glu
 165 170 175
 Ala Met Ser Gly Arg Ile Ile Asn Ile His His Ser Phe Leu Pro Ser
 180 185 190
 Phe Lys Gly Ala Lys Pro Tyr His Gln Ala Tyr Asp Arg Gly Val Lys
 195 200 205
 Ile Ile Gly Ala Thr Ala His Phe Val Thr Ala Asp Leu Asp Glu Gly
 210 215 220
 Pro Ile Ile Glu Gln Arg Ile Ser Arg Val Asp His Gly Met Thr Pro
 225 230 235 240
 Lys Gln Leu Val Asp Glu Gly Ser Ser Ile Glu Ala Leu Val Leu Gly
 245 250 255
 Ala Ala Val Gln Trp Phe Ala Glu Arg Arg Val Phe Leu Asn Asn Ser
 260 265 270
 Lys Thr Val Val Phe Asn
 275

<210> 7
 <211> 594
 <212> DNA
 <213> Triticum aestivum

<220>
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 <222> (358)
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<222> (494)
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<220>
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<222> (565)
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agtcctcgct tcgaagcagg accattgtct gtttgacttg ctgcatagat ggcaagaagg 180
caggcttcca gttgacattc attgtgtgat aagcaaccat gatcgacctg tagataacca 240
tgtgatgctg tttcttcaag aggcacgaaa tcccctatca ttacttacca acgacttcct 300
gggaataaaa gggaacaaga gatattagaa ttgattgaag atacagattt tgttgtgntg 360
ggcaagatat gcangtaatg tcngaaactt ccttaaacad atgggaaaga tattattata 420
tcacaaggct ccttcctcng tcnaaaggag gatcctctag naggctcaat gctgggtnaa 480
ttgattgggtg cacnaccatt tgtacccana cttagcgggc aacatngacc aaggtnaacg 540
gtcccanagg aaattaanac ttgtntnatc tgaaactnng aacatccaca aann 594

<210> 8
<211> 70
<212> PRT
<213> Triticum aestivum

<400> 8
Pro Arg Asp Val Leu Arg Ala Asp Phe Leu Arg Leu Ser Asp Cys Phe
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Ser Ala Gln Lys Ser Thr Val Arg Val Pro Asp Ile Asp Pro Lys Tyr
20 25 30
Lys Ile Ala Val Leu Ala Ser Lys Gln Asp His Cys Leu Phe Asp Leu
35 40 45
Leu His Arg Trp Gln Glu Gly Arg Leu Pro Val Asp Ile His Cys Val
50 55 60
Ile Ser Asn His Asp Arg
65 70

<210> 9
<211> 543
<212> DNA
<213> Oryza sativa

<220>
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<222> (381)
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<220>
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 <222> (440)
 <223> n is a, c, g or t

<220>
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 <222> (449)
 <223> n is a, c, g or t

<220>
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 <222> (466)
 <223> n is a, c, g or t

<220>
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 <222> (470)
 <223> n is a, c, g or t

<220>
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 <222> (507)
 <223> n is a, c, g or t

<220>
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 <222> (521)
 <223> n is a, c, g or t

<220>
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 <222> (524)
 <223> n is a, c, g or t

<400> 9
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 cactcgcat ggccagaaag accctgaggt tgttttgctc agcaagttcg aagatgacca 120
 ctacaaccgt gtccggtaca cgcttgcgtc ttatatcatc aacgagaact caactgggtga 180
 agtgaaattt agcccaatga ggcgagtatt gttggagatg attgagaaag cgttttcaac 240
 cataaacctt gaaacgcaca ctgggaactc acccaaggat tggagtcatt gatgacatgt 300
 ccttcaccc cttgaatcaa gccacaatgg aagatgctgc tcaactggct aagactgtgg 360
 cctctgacat tggcaacttc ntacaagtcc cagtatcctg tatggagcag cacaccccac 420
 tggcaaacct gtgactgcan tacggcgtna actgggctac ttccanccan attcatgggc 480
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 ttg 543

<210> 10
 <211> 296
 <212> PRT
 <213> Oryza sativa

<400> 10
 Arg Cys Lys Leu Tyr Ile Ser Glu Ser Gln Asn Ala Lys Val Val Asp
 1 5 10 15
 Ala Ile Thr Arg Ile Gly Gln Lys Asp Pro Glu Val Val Leu Leu Ser
 20 25 30

Lys Phe Glu Asp Asp His Tyr Asn Arg Val Arg Tyr Thr Leu Ala Ser
 35 40 45
 Tyr Ile Ile Asn Glu Asn Ser Thr Gly Glu Val Lys Phe Ser Pro Met
 50 55 60
 Arg Arg Val Leu Leu Glu Met Ile Glu Lys Ala Phe Ser Thr Ile Asn
 65 70 75 80
 Leu Glu Thr His Thr Gly Thr His Pro Arg Ile Gly Val Ile Asp Asp
 85 90 95
 Met Ser Phe His Pro Leu Asn Gln Ala Thr Met Glu Asp Ala Ala Gln
 100 105 110
 Leu Ala Lys Thr Val Ala Ser Asp Ile Gly Asn Phe Leu Gln Val Pro
 115 120 125
 Val Phe Leu Tyr Gly Ala Ala His Pro Thr Gly Lys Pro Val Thr Ala
 130 135 140
 Val Arg Arg Glu Leu Gly Tyr Phe Gln Pro Asn Tyr Met Gly Ile Gln
 145 150 155 160
 Trp Met Gly Gln Val Leu Pro Asp Ile Leu Pro Val Lys Pro Asp Glu
 165 170 175
 Gly Pro Asp His Val Ser Arg Glu Arg Gly Ala Ile Met Ile Gly Ala
 180 185 190
 Ala Pro Leu Pro Leu Asn Tyr Asn Val Pro Val Leu Ser Lys Asp Ile
 195 200 205
 Pro Thr Ile Arg Arg Ile Thr Arg Arg Val Thr Gly Arg Gly Gly Gly
 210 215 220
 Leu Pro Thr Val Gln Ala Leu Ala Leu Ser His Gly Asp Asp Cys Thr
 225 230 235 240
 Glu Ile Ala Cys Phe Leu Asp Pro Asp His Val Ser Ala Asp Gln Val
 245 250 255
 Gln Gln Gln Val Glu Gln Ile Ala Ala Glu Gln Gly Leu Glu Val Glu
 260 265 270
 Lys Gly Tyr Phe Thr Asp Phe Ser Lys Asp Ala Met Leu Glu Lys Tyr
 275 280 285
 Phe Lys Ile Val Leu Ser Val Asp
 290 295

<210> 11
 <211> 468
 <212> DNA
 <213> Glycine max

<220>
 <221> unsure
 <222> (398)
 <223> n is a, c, g or t

<220>
 <221> unsure
 <222> (423)
 <223> n is a, c, g or t

<220>
 <221> unsure
 <222> (446)
 <223> n is a, c, g or t

<220>
 <221> unsure
 <222> (467)
 <223> n is a, c, g or t

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 aatgccatca acctcgaatt ccatgaaggt gctcaccctc gcttgggcgc actcgacgac 120
 attatcttcc atccacttgg tcatgcgctg ctcgacgagg cagcttggct tgccaaagca 180
 gtggcagcag acattggcaa ccgattcagt gtgccagtgt ttctgtacgc cgcagcccac 240
 ccaacaggga aggaaagttg atgccataag gcgagagctc ggatattacc ggccaaattc 300
 aaggggaagt caatggggccg ggtgggcaat gcccgaaacg ctaccgctga gcctgatgaa 360
 gggccaaacg tgggtttcaa gagctaaagg catcacantt gattgggtgc acgccccttg 420
 ggnttacatt ctacaacggt ccaatncctt tgcactgatg tgtcaant 468

<210> 12
 <211> 128
 <212> PRT
 <213> Glycine max

<220>
 <221> UNSURE
 <222> (87)
 <223> Xaa can be any naturally occurring amino acid

<400> 12
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 Glu Ala Thr Phe Asn Ala Ile Asn Leu Glu Phe His Glu Gly Ala His
 20 25 30
 Pro Arg Leu Gly Ala Leu Asp Asp Ile Ile Phe His Pro Leu Gly His
 35 40 45
 Ala Ser Leu Asp Glu Ala Ala Trp Leu Ala Lys Ala Val Ala Ala Asp
 50 55 60
 Ile Gly Asn Arg Phe Ser Val Pro Val Phe Leu Tyr Ala Ala Ala His
 65 70 75 80
 Pro Thr Gly Lys Glu Ser Xaa Cys His Lys Ala Arg Ala Arg Ile Leu
 85 90 95
 Pro Ala Lys Phe Lys Gly Lys Ser Met Gly Arg Val Gly Asn Ala Arg
 100 105 110
 Asn Ala Thr Ala Glu Pro Asp Glu Gly Pro Asn Val Gly Phe Lys Ser
 115 120 125

<210> 13
 <211> 416
 <212> DNA
 <213> Triticum aestivum

<220>
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 <222> (393)
 <223> n is a, c, g or t

<220>
 <221> unsure
 <222> (398)
 <223> n is a, c, g or t

<220>
 <221> unsure
 <222> (405)
 <223> n is a, c, g or t

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 gagtactaca accgtgtccg ctacacgctt gtctcctaca tcaccaacga aagctcgact 180
 ggtggagctg tatttagccc aatcaggaag gtactgctgg cgatgatcga ggctgcattt 240
 tcagccataa acctcgaagt gcactgtgga actcatccaa ggattggtgt cgtcgatgac 300
 atttcattcc accccttgaa tcaagcggac acaatagagg atgctgctca gctggtaagc 360
 tggtacctct gacattggaa tggttcaatt cantggtgcc aaaangcggg acaata 416

<210> 14
 <211> 302
 <212> PRT
 <213> Triticum aestivum

<400> 14
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 20 25 30
 Val Leu Leu Asn Lys Phe Glu Asp Glu Tyr Tyr Asn Arg Val Arg Tyr
 35 40 45
 Thr Leu Val Ser Tyr Ile Thr Asn Glu Ser Ser Thr Gly Gly Ala Val
 50 55 60
 Phe Ser Pro Ile Arg Lys Val Leu Leu Ala Met Ile Glu Ala Ala Phe
 65 70 75 80
 Ser Ala Ile Asn Leu Glu Val His Cys Gly Thr His Pro Arg Ile Gly
 85 90 95
 Val Val Asp Asp Ile Ser Phe His Pro Leu Asn Gln Ala Asp Thr Ile
 100 105 110
 Glu Asp Ala Ala Gln Leu Ala Lys Leu Val Ala Ser Asp Ile Gly Asn
 115 120 125

Gly	Leu	Gln	Val	Pro	Val	Phe	Leu	Tyr	Ala	Ala	Ala	His	Pro	Thr	Ser	
130						135						140				
Lys	Ser	Val	Ser	Ala	Val	Arg	Arg	Glu	Leu	Gly	Tyr	Phe	Arg	Pro	Asn	
145					150					155					160	
His	Lys	Gly	Val	Gln	Trp	Ala	Gly	Pro	Val	Leu	Pro	Asp	Thr	Leu	Pro	
				165					170					175		
Met	Lys	Pro	Asp	Val	Gly	Pro	Val	His	Val	Pro	Arg	Glu	Arg	Gly	Ala	
			180					185					190			
Thr	Met	Val	Gly	Ala	Gln	Pro	Leu	Val	Glu	Ser	Tyr	Asn	Val	Pro	Ile	
		195					200					205				
Phe	Cys	Lys	Asp	Val	Pro	Thr	Val	Arg	Arg	Ile	Thr	Arg	Arg	Val	Thr	
	210					215					220					
Gly	Arg	Ser	Gly	Gly	Leu	Pro	Ser	Val	Gln	Ala	Leu	Ala	Leu	Phe	His	
225					230					235					240	
Gly	Asp	Asn	Cys	Thr	Glu	Ile	Ala	Cys	Phe	Leu	Leu	Asp	Pro	Asp	His	
				245					250					255		
Val	Gly	Ala	Asp	Arg	Val	Gln	Trp	Leu	Val	Glu	Gln	Ile	Ala	Glu	Glu	
			260					265					270			
Gln	Gly	Leu	Glu	Val	Glu	Lys	Gly	Tyr	Phe	Thr	Asp	Leu	Ser	Lys	His	
		275					280					285				
Met	Met	Leu	Glu	Arg	Tyr	Ser	Glu	Met	Val	Ser	Ala	Ala	Asp			
	290					295					300					

<210> 15
 <211> 1076
 <212> DNA
 <213> Zea mays

<400> 15
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 cgtgccgggg ctggccgtgg tcatcgctgg gagcaggaag gactcgca ga cgtacgtgaa 180
 catgaagcgc aaggcgtgcg ccgaggtcgg catctgctcc atcgacgtcg acctcccga 240
 ggacatctcc gagaccgcgc tcgtcgccga ggttcacgcg ctcaacgctg accccgcagt 300
 gcacgggcatc cttgtccagc ttccacttcc taagcatatc aacgaagaga agatactgag 360
 cgagatttcc atcgagaaag atgtggatgg cttccatcct ctcaacattg gcaagcttgc 420
 aatgaaaggc agagagccac tgttcgtaacc atgtacgcca aaggggtgca tggagctctt 480
 gtcaaggagc ggagtcactg tttaaaggtaa gcgggcagtt gtggttggtc gcagcaacat 540
 cgtcgggcta cctgtatccc tgctccttct gaaggcagat gcgaccgat ctgtttgtgca 600
 ctgcgggacc cctgatcctg aaagcattgt acgcgaagct gacatagtca tcgcggcagc 660
 tgggcaggct atgatgatca aaggtgactg gatcaagcca ggtgctgcgg tcatcgatgt 720
 cgggacgaac tccatcgatg accctaccgc gaagtcgagg gtacggctcg tcggcgatgt 780
 ggatttcgca gcggcgagca aggttgctgg gtacctgact ccggttcccg gaggcggttg 840
 cccaatgacg gtggcaatgc tgctgaagaa cacggtggat ggggcaaagc gggggatagt 900
 cgagtagcta cgttcacgtc acttcacgtt gctgtacggc ctgtgttgca aggatgtgag 960
 ctgactcgaa aagcgtgtgt tggttggtga acaatctgtt tccaagaat aagaatgata 1020
 gtcacagctg ttttcctggt taataaatgc aatgaagaaa gaattttggc tttaaa 1076

<210> 16
 <211> 290

<400> 16

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<210> 17
 <211> 579
 <212> DNA
 <213> Oryza sativa

<220>
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 <222> (316)
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<220>
 <221> unsure
 <222> (411)
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<220>
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 <222> (490)
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<220>
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 <222> (503)
 <223> n is a, c, g or t

<220>
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 <222> (521)
 <223> n is a, c, g or t

<220>
 <221> unsure
 <222> (548)
 <223> n is a, c, g or t

<220>
 <221> unsure
 <222> (562)
 <223> n is a, c, g or t

<400> 17
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 gaaggatgca attgggggttg tgccctgggct ggcagtcatc ctagttgggt caaggaagga 180
 ttctcaaacg tatgtgcgca acaagaagaa ggcattgcgaa gcggttggt tcaagtcata 240
 tgaggttaat ttgccggaag acagctctga ggatgaggtt ctcaagcaca tcgcaacatt 300
 taacagtgat ccgtcngtgc atggcatctt ggtcagttcc cctacctcat catatgaatg 360
 atgagaacat tttgaatgct gtagtattga gaaggatgtt gatggattca nactgaaca 420
 ttggcgactg catgcaagcc ggatcgctct tgtccagcac cctaagatca tggatacacc 480
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 <211> 292
 <212> PRT
 <213> Oryza sativa

<400> 18

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Ile Ala Val Glu Ile Ala Lys Met Lys Asp Ala Ile Gly Val Val Pro
20 25 30

Gly Leu Ala Val Ile Leu Val Gly Ser Arg Lys Asp Ser Gln Thr Tyr
35 40 45

Val Arg Asn Lys Lys Lys Ala Cys Glu Ala Val Gly Ile Lys Ser Tyr
50 55 60

Glu Val Asn Leu Pro Glu Asp Ser Ser Glu Asp Glu Val Leu Lys His
65 70 75 80

Ile Ala Thr Phe Asn Ser Asp Pro Ser Val His Gly Ile Leu Val Gln
85 90 95

Leu Pro Leu Pro His His Met Asn Asp Glu Asn Ile Leu Asn Ala Val
100 105 110

Ser Ile Glu Lys Asp Val Asp Gly Phe His Pro Leu Asn Ile Gly Arg
115 120 125

Leu Ala Met Gln Gly Arg Asp Pro Phe Phe Val Pro Cys Thr Pro Lys
130 135 140

Gly Cys Met Glu Leu Leu His Arg Tyr Gly Val Glu Ile Lys Gly Lys
145 150 155 160

Arg Ala Val Val Ile Gly Arg Ser Asn Ile Val Gly Met Pro Ala Ala
165 170 175

Leu Leu Leu Gln Lys Ala Asn Ala Thr Val Ser Ile Val His Ser Asn
180 185 190

Thr Lys Lys Pro Glu Glu Ile Thr Arg Gln Ala Asp Ile Val Ile Ala
195 200 205

Ala Val Gly Val Ala Asn Leu Val Arg Gly Ser Trp Ile Lys Pro Gly
210 215 220

Ala Ala Ile Ile Asp Val Gly Ile Asn Pro Val Asp Asp Pro Glu Ser
225 230 235 240

Pro Arg Gly Tyr Arg Leu Val Gly Asp Val Cys Tyr Glu Glu Ala Ser
245 250 255

Lys Ile Ala Gly Leu Ile Thr Pro Val Pro Gly Gly Val Gly Pro Met
260 265 270

Thr Ile Ala Met Leu Leu Ser Asn Thr Leu Glu Ser Ala Lys Arg Ile
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His Lys Phe Lys
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<211> 926

<212> DNA
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 ttcatggcat cctcgttcag ttacccttac cttcgcatat gaatgagcag aacatcttga 180
 acgctgtcag gattgagaag gatgtagatg gttttcatcc gttaaataatt ggtcgtcttg 240
 ccatgcgtgg aagagaacct ctgtttgttc cttgtacacc aaagggatgc atagagctac 300
 tgcacagata caatgtttct attaaaggaa agagggctgt tgtgattggg cggagcaata 360
 ttgttggaat gccagctgct ctcttgcttc aaaggggaaga tgctactgtc agtattgtcc 420
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 gtccaatgac catagcaatg cttctacaaa atacactcat ctctgcaaag aggggtgcaca 720
 attttgaata acattgtgaa aggggtgttg ataccattat gagccatcaa tttttgttta 780
 ggtgactcgt ggattttaaagg taggggtttt tcaacattgg gacttaagcc ccaaataaga 840
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 acttgagggg gccccggacc caatat 926

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 <211> 242
 <212> PRT
 <213> Glycine max

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 Gly Tyr Asn Asp Asp Pro Ser Val His Gly Ile Leu Val Gln Leu Pro
 35 40 45
 Leu Pro Ser His Met Asn Glu Gln Asn Ile Leu Asn Ala Val Arg Ile
 50 55 60
 Glu Lys Asp Val Asp Gly Phe His Pro Leu Asn Ile Gly Arg Leu Ala
 65 70 75 80
 Met Arg Gly Arg Glu Pro Leu Phe Val Pro Cys Thr Pro Lys Gly Cys
 85 90 95
 Ile Glu Leu Leu His Arg Tyr Asn Val Ser Ile Lys Gly Lys Arg Ala
 100 105 110
 Val Val Ile Gly Arg Ser Asn Ile Val Gly Met Pro Ala Ala Leu Leu
 115 120 125
 Leu Gln Arg Glu Asp Ala Thr Val Ser Ile Val His Ser Arg Thr Ser
 130 135 140
 Asn Pro Glu Glu Ile Ile Arg Gln Ala Asp Ile Ile Ile Ala Ala Val
 145 150 155 160
 Gly Gln Ala Asn Met Val Arg Gly Ser Trp Ile Lys Pro Gly Ala Val
 165 170 175

Ile	Ile	Asp	Val	Gly	Ile	Asn	Pro	Val	Glu	Asp	Pro	Asn	Ser	Pro	Arg
			180					185					190		
Gly	Tyr	Lys	Leu	Val	Gly	Asp	Val	Cys	Tyr	Glu	Glu	Ala	Ile	Arg	Ile
		195					200					205			
Ala	Ser	Ala	Val	Thr	Pro	Val	Pro	Gly	Gly	Val	Gly	Pro	Met	Thr	Ile
	210					215					220				
Ala	Met	Leu	Leu	Gln	Asn	Thr	Leu	Ile	Ser	Ala	Lys	Arg	Val	His	Asn
225					230					235					240

Phe Glu

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 <212> DNA
 <213> Triticum aestivum

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 <222> (680)
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 <222> (858)..(859)
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<220>
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 <222> (870)
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 tggttcagctt ccattgcccc agcatatcaa cgaagaaaat atcttaaacc agatctccat 360
 tgagaaagat gtgcacggct ttcatacctt gaacattggc aagcttgcaa tgaaaggcag 420
 agatccactg ttcgtacctt gcacgccaaa gggatgcatg gagctcctgt cacgaagtgg 480
 cgtcactgta aaaggaaaac acgcagttgt ggttgggcgt agcaacatcg tgggtttacc 540

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gatgatcaag ggagactggn ttaaacaata gcgcaacgnc atcnacgtcg ggacaatcca 720
tcgacgacca acaagaatct gggtaaaatc cttggnagtg gttctcngag naacaagccn 780
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<210> 22
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<212> PRT
<213> Triticum aestivum

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<223> Xaa can be any naturally occurring amino acid

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20 25 30

Ala His Asn Ile Val Pro Gly Leu Ala Val Val Ile Val Gly Ser Arg
35 40 45

Lys Asp Ser Gln Thr Tyr Val Gln Met Lys Arg Lys Ala Cys Ala Glu
50 55 60

Val Gly Ile Arg Ser Phe Asp Val Asp Leu Pro Glu Asp Ile Ala Glu
65 70 75 80

Ala Ala Leu Val Ala Glu Val His Arg Leu Asn Ala Asp Pro Ala Val
85 90 95

His Gly Ile Leu Val Gln Leu Pro Leu Pro Lys His Ile Asn Glu Glu
100 105 110

Asn Ile Leu Asn Gln Ile Ser Ile Glu Lys Asp Val Asp Gly Phe His
115 120 125

Pro Leu Asn Ile Gly Lys Leu Ala Met Lys Gly Arg Asp Pro Leu Phe
130 135 140

Val Pro Cys Thr Pro Lys Gly Cys Met Glu Leu Leu Ser Arg Ser Gly
145 150 155 160

Val Thr Val Lys Gly Lys His Ala Val Val Val Gly Arg Ser Asn Ile
165 170 175

Val Gly Leu Pro Ser Ile Pro Ser Pro Ser Glu Ser Gly Arg Tyr Arg
180 185 190

Val Asp Xaa Ala Ser Thr Asp Pro Asn Pro Gln Thr Ile Ser Val Lys
195 200 205

Gln Asp Ile Val Ile Ala Ala Ala Gly Gln Ala Met Met Ile Lys Gly
210 215 220

Asp Trp Xaa Lys Gln Lys Arg Asn Xaa Ile Xaa Val Gly Thr Ile His
225 230 235 240

Arg Arg Pro Thr Arg Ile Trp Val Lys Ser Leu Xaa Val Val Leu Xaa
245 250 255

Xaa Thr Ser Xaa Val Thr Asp Arg Pro Gly Xaa Ser Ala Ile Leu Xaa
260 265 270

Phe Leu Lys Lys Gly Xaa Xaa Lys Xaa Xaa His Asp Ser Xaa Ile Glu
275 280 285

Gly